Please add the following new claim 44:

44. (New) A method as defined in claim 43 wherein each evaporation chamber's irrigation rate reaches its peak irrigation rate periodically.

Please add the following new claim 45:

45. (New) An evaporator-and-condenser unit as defined in claim 24 wherein:

A) the evaporation-and-condenser unit includes a plurality of the evaporation chambers; and

B) the times at which the rates of irrigation of some of the evaporation chambers reach their respective peak irrigation rates are different from those at which others of the evaporation chambers do.

5 End

Please add the following new claim 46:

46. (New) A method as defined in claim 45 wherein each evaporation chamber's irrigation rate reaches its peak irrigation rate periodically.

REMARKS

By the foregoing amendments, Applicant has added new claims 39-46 so as to provide a greater range of claim scopes. He has additionally amended claims 5, 13, 20, and 26 so as to make them depend on claims 39, 41, 43, and 45, respectively, rather than on the claims on which they previously depended.

As the patent application indicates in the portion that extends from the paragraph bridging pages 10 and 11 through the paragraph bridging pages 12 and 13, the recirculant liquid as well as the liquid added to it to make up for evaporation is sent through two parallel paths to the heat exchanger's evaporation chamber. In one of the paths, the liquid flows si-

multaneously to all of the evacuation chambers through spray arms 58 at a more or less steady rate. But the rate at which the evaporation chamber's heat-exchange surfaces are thereby irrigated is not by itself great enough to keep those surfaces wetted and thereby keep heat transfer efficient. In the other path, the liquid flows through nozzles 142 and 144 to only a few of the evaporation chambers at a time. But those nozzles reciprocate, so all of the chambers are irrigated by those nozzles at different points in the irrigation cycle. Consequently, each chamber periodically experiences an interval in which it is irrigated at a high rate. Because they are thus irrigated at a high rate from time to time, the chamber's surfaces remain wetted even though the irrigation during this interval does not raise the average irrigation rate to the level that, if maintained steadily, would keep the surface wetted.

The claims define this concept of a technique for keeping the evaporation surfaces wetted despite using an average irrigation rate that is less than the steady-state rate required to keep the surfaces wetted. Claim 1, for instance, recites that the evaorator-condenser system defined there includes a varying-rate evaporation-chamber irrigation system "whose rate of irrigation of each said evaporation chamber has a respective average irrigation rate and so varies as repeatedly to reach a respective peak irrigation rate that is at least twice the average irrigation rate thereof. . . ." But the Examiner has rejected claims 1-5, 10-12, 17-20, 24, 25, and 38 as defining subject matter that is obvious in view of British Patent Number 757,085 to Hickman, U.S. Patent Number 2,894,879 to Hickman, U.S. Patent Number 4,198,360 to Shafranovsky et al., or U.S. Patent Number 4,283,255 to Ramshaw et al.

As one basis for this rejection, the Examiner merely refers to her previous action. The basis of the rejection was that the limitation quoted above did not provide a patentable

distinction, because it was more in the nature of a process limitation, whereas the claims involved are apparatus claims.

As Applicant pointed out in the previous response, though, the weight of authority holds that it is perfectly proper for a claim to define an apparatus in terms of what it does rather than in terms of a particular one of the many possible structures for doing what it does. The Court of Customs and Patent Appeals made this clear in *In re Swinehart*,169 USPQ 226, 229 (CCPA 1971):

> We take the characterization "functional", as used by the Patent Office and argued by the parties, to indicate nothing more than the fact that an attempt is being made to define something (in this case, a composition) by what it does rather than by what it is (as evidenced by specific structure or material, for example). In our view, there is nothing intrinsically wrong with the use of such a technique in drafting patent claims. Indeed we have even recognized in the past the practical necessity for the use of functional language.

Indeed, in his concurring opinion, Judge Lane pointed out that there really is little in apparatus claims that is not functional:

> It cannot be the law that all functional terms are condemned when used to distinguish a claimed invention from the prior art. If this is the law, and it is carried to its logical conclusion, many nouns and adjectives would be condemned as functional, since they define in terms of use or effect. For example, a "door" is something used to close and open a passageway; a "nail" is an object used to hold two pieces of material together; a "black" material is one incapable of reflecting visible light. It is apparent to me that if functionality at the point of novelty is ever per se a ground for rejecting claims, it is not always so.

Id. at 230.

The Examiner goes on to state that "[t]here are even no means recited nor provided in the claims nor in the specification used for varying, monitoring, regulating or controlling the peak rate, or the average rate such that the argued '...a varying-rate irrigation system whose rate for each evaporation chamber so varies has to have a peak at least twice its average' is measured." The relevance of this statement is not clear. The reason why the claim contains nothing about measuring the rate is that the claim is not directed to an apparatus for measurement. It is instead directed to evaporating and condensing.

Moreover, the specification gives ample disclosure of the matter in which the relative rates are controlled. As is explained at the top of specification page 12, an open–state valve member 130 permits flow into the two parallel paths through ports 132 and feed conduit 150 respectively. Anyone skilled in the art will recognize that a desired division of flow between parallel paths is readily achieved by designing those paths with an appropriate flow-resistance relationship. As is indicated at the bottom of specification page 12, the result in the illustrated example is a ratio such that, in a situation in which the rates of pumping and evaporation yield a total flow of 246 gallons per hour, 30 gallons per hour will flow through the scanner nozzles, while 216 gallons per hour will flow through the spray arms. That, together with fact, set forth at the bottom of page 12, that the scanner nozzles are so sized as to overlap two evaporation chambers each and thus spray an average of four chambers at a time, clearly indicates how the illustrated embodiment so controls flow as to achieve a peak rate that exceeds twice the average rate.

The Examiner further states: "The prior art sprayer or nozzles are deemed to be a variable system whose flow are [*sic*] subject to change as the pumping rate change [*sic*] or as

is monitored by metering valves. Thus, the apparatus of the prior art is obviously capable of performing the argued function i.e., achieve '...a peak irrigation rate that is at least twice its average irrigation rate'." As Applicant understands it, the Examiner is saying two things. The first, with which Applicant agrees, is that it would be obvious to vary the (apparently fixed) irrigation rates in the prior-art devices. The other, with which Applicant does not agree, appears to be that, since it would have been obvious to vary irrigation rates, it would also have been obvious to vary them in the manner that Applicant defines, i.e., in such a manner as "repeatedly to reach a respective peak irrigation rate that is at least twice the average irrigation rate thereof. . . ."

Now, efficiency is paramount in a distiller, and a major determinant of a distiller's efficiency is the heat-transfer rate that it can achieve. And that is in turn determined by a great extent by how thin the liquid film on its heat-transfer surfaces can be and still keep them wetted. As the specification explains, varying the irrigation rate in the particular way the claims define results in the ability to maintain wetting despite a relatively low rate of irrigation and thus a relatively thin liquid film. So Applicant's irrigation technique yields an all-important efficiency advantage, of which prior art workers would have availed themselves if it had been obvious to do so. The fact that they did not shows that Applicant's technique was not obvious.

Finally, the Examiner cites *In re Linder*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972), and *In re Wood*, 582 F.2d 638, 642, 199 USBQ 137, 140 (CCPA 1978), for the proposition that "[u]nexpected results must be established by factual evidence. Mere arguments or conclusory statements in the specification, Applicant's amendments or the Brief

do not suffice." But the Examiner does not indicate what the relevance of that proposition is to the instant application. The paragraph bridging Applicant's pages 12 and 13 demonstrates that Applicant's invention was able to keep the heat-transfer surfaces wetted at an average irrigation rate tthat was only 28% of the rate that would have been required to keep them wetted if the irrigation had been steady. This is experimental proof, not a "conclusory statement."

Applicant therefore requests that the Examiner withdraw her rejections and allow all claims currently in the application.

A check in the amount of $894, including the $750 RCE fee and $144 to cover the additional-claims fee, is enclosed. Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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MARK-UP PAGES FOR THE FEBRUARY 21, 2003, AMENDMENT TO U.S. PATENT APPLICATION SER. NO. 09/765,263

The replacement for claim 5 resulted from the following changes:

5. An evaporator-and-condenser unit as defined in claim ~~1~~ 39 wherein the irrigation system includes:

A) a main sprayer system that irrigates each said evaporation chamber for at least the majority of the time; and

B) an auxiliary sprayer system that irrigates each said at least one evaporation chamber for only a minority of the time, the rate at which each said evaporation chamber is irrigated while the auxiliary sprayer system is irrigating it being at least twice the average irrigation rate thereof.

The replacement for claim 13 resulted from the following changes:

13. An evaporator-and-condenser unit as defined in claim ~~11~~ 41 wherein the irrigation system includes:

A) a main sprayer system that irrigates each said evaporation chamber for at least the majority of the time; and

B) an auxiliary sprayer system that irrigates each said at least one evaporation chamber for only a minority of the time, the rate at which each said evaporation chamber is irrigated while the auxiliary sprayer system is irrigating it being at least twice the average irrigation rate thereof.

The replacement for claim 20 resulted from the following changes:

20. An evaporator-and-condenser unit as defined in claim ~~17~~ 43 wherein the irrigation system includes:

A) a main sprayer system that irrigates each said evaporation chamber for at least the majority of the time; and

B) an auxiliary sprayer system that irrigates each said at least one evaporation chamber for only a minority of the time, the rate at which each said evaporation chamber is irrigated while the auxiliary sprayer system is irrigating it being at least twice the average irrigation rate thereof.

The replacement for claim 26 resulted from the following changes:

26. An evaporator-and-condenser unit as defined in claim ~~24~~ 45 wherein the irrigation system includes:

C) a main sprayer system that irrigates each said evaporation chamber for at least the majority of the time; and

D) an auxiliary sprayer system that irrigates each said at least one evaporation chamber for only a minority of the time, the rate at which each said evaporation chamber is irrigated while the auxiliary sprayer system is irrigating it being at least twice the average irrigation rate thereof.